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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

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(PCT Article 36 and Rule 70)

Applicant's or agent's file reference A3-066PCT	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/416)	
International application No. PCT/US 03/26529	International filing date (day/month/year) 25.08.2003	Priority date (day/month/year) 30.08.2002
International Patent Classification (IPC) or both national classification and IPC H01R12/20		
Applicant MOLEX INCORPORATED et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 4 sheets, including this cover sheet.
- ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).
- These annexes consist of a total of 5 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the opinion
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 09.03.2004	Date of completion of this report 24.11.2004
Name and mailing address of the international preliminary examining authority:  European Patent Office - Gitschiner Str. 103 D-10958 Berlin Tel. +49 30 25901 - 0 Fax: +49 30 25901 - 840	Authorized Officer Stirn, J-P Telephone No. +49 30 25901-565 

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/US 03/26529

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17))*):

Description, Pages

1-10 as originally filed

Claims, Numbers

1-26 received on 10.08.2004 with letter of 06.08.2004

Drawings, Sheets

1/6-6/6 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
☐ the language of publication of the international application (under Rule 48.3(b)).
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority in written form.
☐ furnished subsequently to this Authority in computer readable form.
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. **PCT/US 03/26529**

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-26
	No: Claims	
Inventive step (IS)	Yes: Claims	1-26
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-26
	No: Claims	

2. Citations and explanations

see separate sheet

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/US 03/26529

Re Item V

**Reasoned statement with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement**

1. Reference is made to the following document:
D1: US-B-6319052
2. The document D1 is regarded as being the closest prior art to the subject-matter of claims 1,15,24, and discloses an electrical connector comprising a housing with a plurality of terminals which are mounted onto a flat circuit. A reinforcing member is inserted into a through passage of the housing and soldered to the flat circuit.

The subject-matter of claims 1,15,24 differs from this known connector in that the reinforcing member has an elongated narrow foot and a locking portion extending oblique to the body portion and engaging a locking surface of the housing.

The subject-matter of claims 1,15,24 is therefore new (Article 33(2) PCT).

The problem to be solved by the present invention may be regarded as how to minimise the space required for soldering a reinforcing member of a connector to a flat circuit.

The solution to this problem proposed in claims 1,15,24 of the present application is considered as involving an inventive step (Article 33(3) PCT) for the following reasons: The reinforcing member has an elongated narrow foot which is mounted to the flat circuit.

3. Claims 2-14,16,23,25,26 is/are dependent on claims 1,15,24 and as such also meet the requirements of the PCT with respect to novelty and inventive step.

1. An electrical connector (40) for interconnecting a pair of flat circuits, comprising:
a housing (42) having a front mating face (42a), a rear terminating face (42b), a top face (42c) and a bottom face (42d) for mounting on a first flat circuit, the housing including a cavity (46) for receiving a second flat circuit with the cavity having an insertion opening (48) in the front mating face of the housing, and the housing having at least one through passage (62) extending from the top face through the bottom face thereof;

a plurality of terminals (44) mounted in the housing along said cavity (46), the terminals having contact portions (44c) for engaging appropriate circuit contacts on the second flat circuit when the second flat circuit is inserted through said opening into the cavity; and

a reinforcing member (60) having a body portion (60a) inserted into said through passage (62) in the housing from the top face thereof and including an elongated narrow foot portion (60c) exposed at the bottom face of the housing for securing to the first flat circuit, and the reinforcing member having a locking portion (60b) extending oblique to the body portion (60a) and engageable with a locking surface (70) on the housing.

2. The electrical connector of claim 1 including a pair of said through passages (62) and a corresponding pair of said reinforcing members (60) at opposite sides of the housing.

3. The electrical connector of claim 2 wherein said pair of through passages (62) are located in the housing outside opposite ends of said cavity (46).

4. The electrical connector of claim 1 wherein said housing (42) is fabricated of dielectric plastic material and said reinforcing member (60) is fabricated of metal material.

5. The electrical connector of claim 4 wherein said reinforcing member (60) includes a plurality of claws (72) for skiving into the plastic material of the housing within the through passage (62).

6. The electrical connector of claim 1 wherein said reinforcing member (60) is generally L-shaped, with the body portion (60a) and the locking portion (60b) of the reinforcing member forming respective oblique legs of the L-shape.

7. The electrical connector of claim 6 wherein the body portion (60a) and the locking portion (60b) of said reinforcing member (60) are generally planar.

8. The electrical connector of claim 7 wherein the top face (42c) of the housing includes a recess (62b) for receiving the locking portion (60b) of said reinforcing member (60) generally flush with the top face.

9. The electrical connector of claim 1 wherein said through passage (62) is generally L-shaped to define a first leg (62a) extending from the top face (42c) through the bottom face (42d) of the housing and a second, oblique leg (62b) forming a recess in the top face of the housing for receiving the locking portion (60b) of the reinforcing member generally flush with the top face.

10. The electrical connector of claim 1 wherein said body portion (60a) of the reinforcing member (60A) is generally planar, and said locking portion is in the form of a locking arm (80) coplanar with and projecting outwardly of the body portion.

11. The electrical connector of claim 10, including a pair of said locking arms (80) projecting outwardly from opposite sides of the body portion.

12. The electrical connector of claim 1 wherein said body portion (60a) of the reinforcing member (60) is generally planar, and said foot portion (60c) is bent into a U-shaped configuration with arms which form the U-shaped configuration, being parallel and adjacent to each other, to define a tangent line of securement (60d) with the first flat circuit.

13. The electrical connector of claim 12 wherein said reinforcing member (60) is stamped and formed of sheet metal material.

14. The electrical connector of claim 12 wherein said U-shaped foot portion (60c) is soldered to an appropriate securing pad on the first flat circuit along said tangent line of securement (60d).

15. An electrical connector (40) for interconnecting a pair of flat circuits, comprising: a housing (42) fabricated of dielectric plastic material and having a front mating face

(42a), a rear terminating face (42b), a top face (42c) and a bottom face (42d) for mounting on a first flat circuit, the housing including a cavity (46) for receiving a second flat circuit with the cavity having an insertion opening (48) in the front mating face of the housing, and the housing having a pair of through passages (62) extending from the top face through the bottom face thereof, each through passage (62) being generally L-shaped to define a first leg (62a) extending from the top face through the bottom face of the housing and a second, oblique leg forming a recess (62b) in the top face of the housing;

a plurality of terminals (44) mounted in the housing along said cavity (46), the terminals having contact portions (44c) for engaging appropriate circuit contacts on the second flat circuit when the second flat circuit is inserted through said opening into the cavity; and

a pair of reinforcing members (60) fabricated of metal material and having a body portions (60a) inserted into said pair of through passages (62) in the housing from the top face thereof, the reinforcing members including elongated narrow feet portions (60c) exposed at the bottom face of the housing for securing to the first flat circuit, each reinforcing member (60) being generally L-shaped corresponding to the L-shape of the through passages (62), with the body portion (60a) forming one leg of the L-shape and a locking portion (60b) extending oblique to the body portion and forming an oblique leg of the L-shape, the locking portion being engageable with a locking surface (70) on the housing.

16. The electrical connector of claim 15 wherein said pair of through passages (62) are located in the housing outside opposite ends of said cavity (46).

17. The electrical connector of claim 15 wherein said reinforcing members (60) include a plurality of claws (72) for skiving into the plastic material of the housing within the through passage.

18. The electrical connector of claim 15 wherein the body portion (60a) and the locking portion (60b) of each reinforcing member are generally planar.

19. The electrical connector of claim 15 wherein the body portion (60a) of each reinforcing member (60A) is generally planar, and including an additional locking portion in the form of a locking arm (80) coplanar with and projecting outwardly of the body portion.

20. The electrical connector of claim 19, including a pair of said locking arms (80) projecting outwardly from opposite sides of the body portion (60a).

21. The electrical connector of claim 15 wherein said body portion (60a) of each reinforcing member (60) is generally planar and the foot portion (60c) thereof is bent into a U-shaped configuration to define a tangent line of securement (60d) with the first flat circuit.

22. The electrical connector of claim 21 wherein said reinforcing members (60) are stamped and formed of sheet metal material.

23. The electrical connector of claim 21 wherein said U-shaped foot portion (60c) is soldered to an appropriate securing pad on the first flat circuit along said tangent line of securement (60d).

24. An electrical connector (40) for interconnecting a pair of flat circuits, comprising:
a housing (42) having a front mating face (42c), a rear terminating face (42b), a top face (42c) and a bottom face (42d) for mounting on a first flat circuit, the housing including a cavity (46) for receiving a second flat circuit with the cavity having an insertion opening (48) in the front mating face of the housing, and the housing having at least one through passage (62) extending from the top face through the bottom face thereof;

a plurality of terminals (44) mounted in the housing along said cavity (46), the terminals having contact portions (44c) for engaging appropriate circuit contacts on the second flat circuit when the second flat circuit is inserted through said opening into the cavity; and

a reinforcing member (60) having a generally planar body portion (60a) inserted into said through passage (62) in the housing from the top face thereof and including an elongated narrow foot portion (60c) exposed at the bottom face (42d) of the housing for securing to the first flat circuit, said foot portion being bent into a U-shaped configuration with arms, which form the U-shaped configuration, being parallel and adjacent to each other, to define a tangent line of securement (60d) with the first flat circuit (60a).

25. The electrical connector of claim 24 wherein said reinforcing member (60) is stamped and formed of sheet metal material.

26. The electrical connector of claim 24 wherein said U-shaped foot portion (60c) is soldered to an appropriate securing pad on the first flat circuit along said tangent line of securement (60d).